

CLAIMS

1. Pressure amplifier including a low pressure inlet for supplying medium at low pressure, a low pressure piston with a first operational area and at least one high pressure piston with a second operational area, the second area being of same size or less than the first area, and at least one high pressure outlet, **characterised in that** a low pressure area (1) communicates with a operational chamber (29), which is limited by a low pressure piston (26) and a surrounding cylinder (7); where at least one high pressure piston (12) is provided interacting with the low pressure piston (26), and that the high pressure piston (12) is co-axially arranged in a high pressure cylinder (13) relative to the low pressure piston; that a changeover valve (19) is coaxially arranged in the cylinder (7), and that in connection with the valve (19) there is arranged at least one spring (10,36) coaxially around an impulse rod (24); that the spring (10,36) is arranged to be compressed at the movement of the low pressure piston so that a spring loaded locking mechanism (3, 35) is instantly released, the locking mechanism being built up of one or more springs (4) that press a locking member (3, 35) against a corresponding lock abutment formed in the valve (19), so that the valve shifts and opens for medium supply to the operational chamber while simultaneously the low pressure piston, via contact with the high pressure piston, is moving the latter towards the high pressure outlet (15), whereby the impulse rod (24) via impulse spring (10,36) and the mechanical stops (8,9,22,23,25) in the end position releases the locking mechanism (3, 35) whereby the valve shifts and the low pressure medium, via the low pressure connection (6) via check valve (11), presses the high and low pressure pistons back.
2. Pressure amplifier according to claim 1, **characterised in that** the locking arrangement is built up in at least one boring provided radially in the low pressure cylinder (7), and that in the boring a ball or a wedge (35) has been provided, the ball or wedge interacting with a spring (4) so that the ball or wedge (35) are pressed down into one of two recesses (34) with same dimensions as the part of the ball or wedge (35) provided in the cylindric surface of the valve (19).
3. Pressure amplifier according to claim 1 or 2, **characterised in that** the locking ar-

5 rangement is built up in an annular, flat, round groove (45) provided at the inner side of the low pressure cylinder (7), so that at least two U-shaped locking members (3) are arranged in the groove, the locking members (3) being chamfered at the ends (17), that a number of radially oriented borings (43) have been provided, corresponding to the number of locking members (3), and that in each boring (43) there is arranged a spring (4) pressing the blocks (3) towards the centre line (44) of the cylinder so that the chamfered ends (17) of the blocks co-operate hold a locking element (18) arranged in the valve in one of two positions on respective chamfered sides (17) of the blocks (3).

10 4. Pressure amplifier according to one or more of claims 1 - 3, **characterised in that** the pressure amplifier is double-acting so that the impulse rod (24) is interacting with two high pressure pistons (12) arranged at opposite sides of the operational chamber (29), and that furthermore two high pressure outlets (15) are provided that optionally may be brought together to a common outlet.

15 5. Pressure amplifier according to one or more of claims 1 - 4, **characterised in that** the high pressure piston (12) and impulse rod (24), respectively, are loosely connected to the low pressure piston (26), e.g. by means of flanges that are provided at one end of the high pressure piston and the impulse rod, respectively, the flanges (46) largely fitting in corresponding cavities provided in the end faces of the low pressure piston so
20 ~~that the flanges are loosely held by means of locking rings (8).~~

25 6. Pressure amplifier according to one or more of claims 1 - 5, **characterised in that** high and low pressure pistons, high and low pressure cylinders, check valves, high and low pressure connections with associated springs and locking mechanisms are arranged coaxially and symmetrically around a common centre line (44).

30 7. Pressure amplifier according to one or more preceding claims, **characterised in that** the connections between the cylinder borings (40) and the parallel axial connections (6,16,40,41) and annular channels (30,31,32,33,34,39) are established by radial milling from inside the cylindric boring.

8. Pressure amplifier according to one or more preceding claim, **characterised in that**

one or two of the oscillating pistons are used for driving a pump fitted thereon for pumping another medium than the drive medium, or for driving other oscillating apparatuses.

- 5 9. Pressure amplifier according to one or more preceding claim, **characterised in that**
externally of the valve, an annular turning is provided with a diameter less than the
outer diameter of the valve and a length in longitudinal direction of the pressure am-
plifier, the length being substantially less than the length of the valve, and that at least
10 two holes are provided in the valve radially from the interior of the valve to the out-
side of the valve, and that one hole is provided coinciding with the annular turning,
and that the other hole is provided outside the annular turning.